mimatic®
Tool Systems

Operating Instructions for Angle Heads

mimatic Zettl GmbH – Westendstraße 3 – D-87488 Betzigau
Tel. +49(0) 831 / 57 444 – 0 // Telefax +49(0) 831 / 57 444 – 90
info@mimatic-zettl.de // www.mimatic-zettl.de

Introduction

Dear Customer,

We would first like to thank you for your purchase from Mimatic-Zettl.

You have chosen a high quality product that will only improve your manufacturing processes.

The following instructions will help you to better understand and get to know your angle head, and also explain the best practices on it's use.

Please pay attention to the following important secuirty – and warnings, so your angle head will remain trouble-free.

We would be happy to supply you with any of our other products from both our standard and custom programs. For further information please contact Mimatic's home office or any of our global sales representatives.

All rights reserved: mimatic Zettl GmbH – Westendstraße 3 – 87488 Betzigau

These directions - or any extracts from – may be shared with a third party, only with the expressed or written agreement, from mimatic Zettl GmbH.

Any who reproduce, distribute or store this material on any medium without the expressed approval from Mimatic Zettl GmbH, will be fully prosecuted under the claimed copy right laws.

We reserve the right to make any technical changes and improvements that may not be reflected in this handbook.

Responsible author for the contents of these instructions:

mimatic Zettl GmbH – Westendstraße 3 – 87488 Betzigau

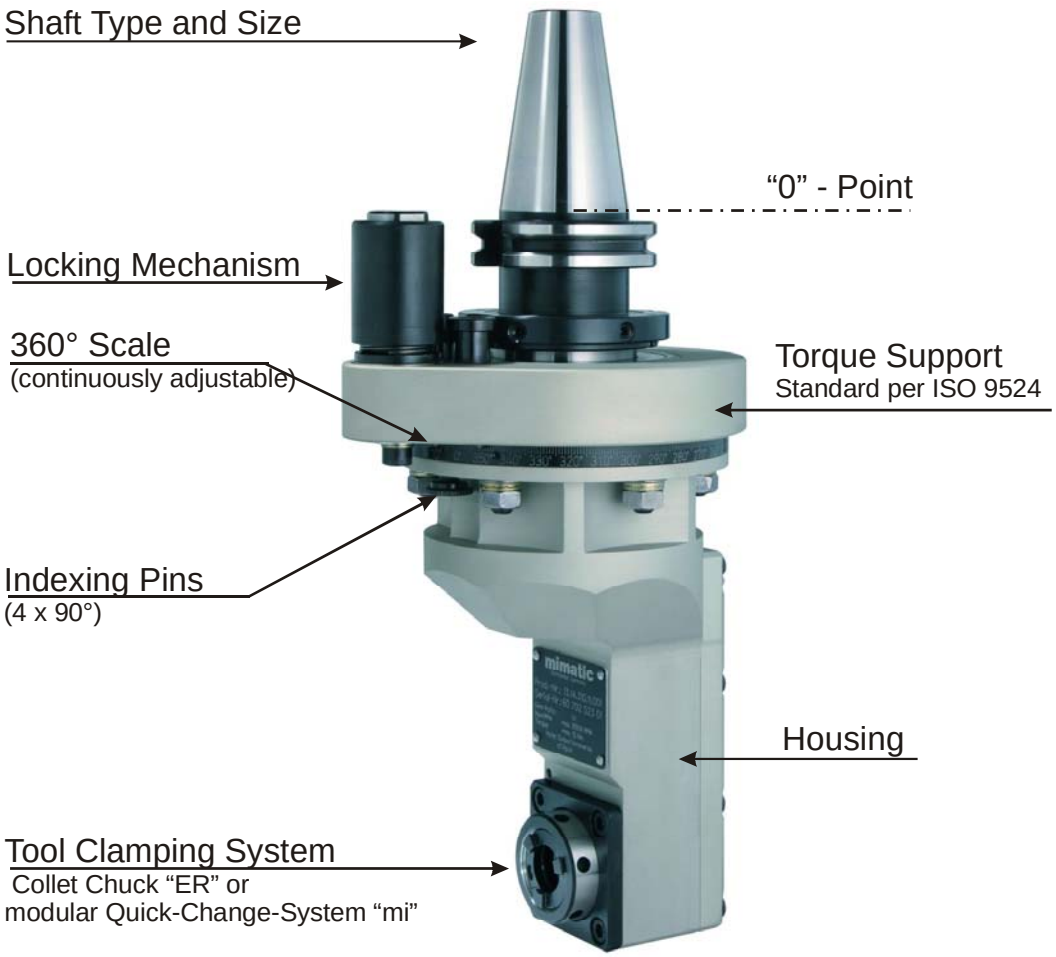
Contents

		Seite
1	Concept Definitions	4
2	Basic Safety Guidlines	5
2.1	Recommended Use	5
2.2	Arbitrary Reconstruction	5
2.3	Symbol Definitions	6
2.4	Product Awareness	7
2.5	Qualified Operators	7
2.6	Responsibilities of Operator	7
2.7	Protective Equipment	7
2.8	Operational Hazards	8
2.8.1	Mechanical Dangers	8
2.8.2	Excessive Warming	8
2.9	Intended Use	9
2.10	Warranty	9
3	Transport and storage	10
3.1	Protecting the tool during transport	10
3.2	Storage	10
4	Set up and Installation	11
4.1	Adjusting the Angle Position	11
5	Coolant Supply	12
6	Initial Operation and Application	13
7	Issues and Troubleshooting	14
8	Maintenance and Repair	15
8.1	Maintenance	15
8.2	Repair	16

1 Concept Definitions

Product specific descriptions are explained in the below drawing.

For custom angle heads, you will also receive a dimensional drawing, which provides specific product descriptions.



2 Basic Safety Instructions

These operating instructions should always be kept in the same place where the angle head is stored.
The following policies provide safety instructions to prevent accidents and also optimize the use of the angle head.

2.1 Recommended Use

The angle head is designed to be used in machining centers, for example on milling, drilling and tapping applications.

Any non-approved usage of the angle head can result in a void of the warranty and Mimatic will not be held responsible.

Always observe these best practices for the angle head that are explained in this manuel:

- Set-up and maintenance of the angle head.
- Not exceeding the recommended running time.
- Observing max. RPMs when running tool with/without coolant.
- Also, the limits of the clamped cutting tools.

More precise information on the performance of the angle head can be found on the provided technical drawings.

2.2 Arbitrary Modification

Do not modify or re-build the angle head without authorization from Mimatic. If the user or owner decides to make any modifications or attempts to repair or re-build the tool, the warranty can be voided if damage occurs from improper usage.

2.3 Symbol Explination

In this instruction manuel, the following symbols are frequently used. Please pay attention to their following explinations:

DANGER

DANGER: This symbol means there is a risk or danger to the operator.

Not adhering to this recommendation can result in serious consequences to both the angle head and the health of the operator.

Recommendation:

Recommendation

Under this symbol you will find recommendations, application tips and useful Information.

2.4 Product Damage

Too high of a noise level or too high of a temperature when the angle head is run, can be caused by bearing or gear damage, or if the tool has not been properly set-up in the machine.

In chapter 7 you will find tests and troubleshooting to address any symtoms of damage. Please inform Mimatic immediatly of any issues. If the problem still exists after you have performed the troubleshooting, do not run the tool as serious damage could occur to the user, angle head or machine.

2.5 Qualified Operators

Only qualified operators may run the angle head. The operator must understand the proper set-up, service, maintence and useage of the tool. Those who are learning how to use the tool must always do so under the supervision of a qualified operator.

2.6 Responsibilities of the Owner

The owner is responsible for informing all operators of the angle head about the safety instrusctions and best practices. The owner is also responsible for:

- Briefing all operators on the safety instructions and prevention of accidents before the operator begins using the angle head.
- Making sure the angle head is set-up only on a machine that conforms to all safety regulations.

2.7 Protective Equipment

DANGER

Always wear safety shoes, protective glasses and ear protection. When lifting or transporting the angle head, if needed, wear extra back support to avoid injury.

2.8 Operational Hazards

2.8.1 Mechanical Hazards

DANGER

DANGER:
Using too high pressure or defective seals can cause coolant to leak into the angle head. Regularly test the coolant pressure from the machine and always pay close attention to the tool to make sure no leakage is occuring.

WARNING

WARNING:
When using the angle head, make sure that the safety features of your machine are on. Also make sure that the cutting tool is properly clamped.

2.8.2 Heating of the Angle Head

DANGER

DANGER:
During use of the angle head, the acceptable temperature of the tool is less then 75°C. Always wear saftey gloves when moving or switching out the angle head.

DANGER

DANGER:
Always keep the angle head away from flammable or explosive materials.

2.9 Intended Use

CAUTION

CAUTION:
If the head is not used for it's intended applications, harm may come to the operator, angle head or the machine itself.

2.10 Warrantee

Warranties and liability claims are void if the operator does not adhere to the following points:

- Improper usage of tool.
- Betreiben des Winkelkopfes bei defekten und/oder nicht funktionsfähigen, bzw. ausgeschalteten Sicherheits- und Schutzeinrichtungen
- Disregard of the directions for use including: storage, maintence and set-up of the angle head.
- Making alterations to the angle head without consent or approval from Mimatic GmbH.
- Exceeding the operational parameters of the angle head.
- Not properly monitoring the tool while it is in use.
- Crash resulting from an unapproved repair of tool.
- Crash resulting from the introduction of foreign parts into the angle head.

For more detailed warranty information, please visit our website under „Verkaufs- und Lieferbedingungen", and the information can be downloaded from there.

3 Transportation and Storage

Please read the following best practices on transportation and storage of your angle head. Even slight damage to the angle head can make it unusable or cause damage to the machine when used.

If you are going to be transporting or storing the angle head for an extended amount of time, please consult with Mimatic or your sales representative first.

3.1 Protecting the tool during transport

When transporting, make sure to protect the following areas of the tool:

- Drive shaft
- Any supports, locking mechanisms and surfaces that could be damaged.
- Collet

3.2 Storage

If the angle head is going to be stored for an extended amount of time, please pay attention to the following points:

- Store only in a dry space.
- Make sure to oil the tool.
- Protect the surfaces of the tool from damage with proper packaging material.
- After a long storage time, make sure to clean the tool before it is put into use.
- Before the tool returns to service, make sure to see if the locking mechanism is working properly and test make sure the drive gear is working without obstruction.

DANGER

COLLISIONS

When the angle head is put into use on a new machine, or if the tool has not been used on the same machine for some time, always test the swing clearances to make sure no collision or crash will occur.

4 Set-up and Installation

The basic set-up of the angle head can be found in chapter 1. For all applications of the angle head please pay attention to the technical features and the product specific drawings for your tool.

The boring spindle(s) come equipped with high-quality spindle bearings. All drive components are build for high speed RPMs.

Our angle heads can be fitted with variuos tool spindles depending on the customer's needs.

CAUTION

CAUTION – COLLISION RISKS

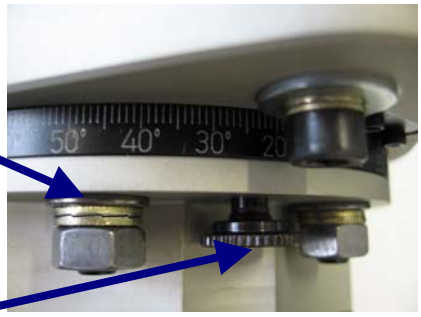
Missuse can cause damage to both the machine and the angle head itself.

Important: the angle heads are generally designed for a specific machine type or specific manufacturer.

Perform a collision test with a clamped tool in the anlge head before each new use.

4.1 Adjusting the Angle Position

The anlgle head is 360° rotatable.
Loosen or unlock the **6 nuts**,
then adjust the tool to the desired angle.



You can easily position the angle head every 90°.

With the help of the **indexing pin** (when all 6 nuts are loosend and the pin pulled out) the angle head automatically stops in four 90° intervals.

CAUTION

After the desired angle has been set-up and before the use of the angle head, make sure the 6 nuts have been fully tightened ! **Tightening torque 20 – 22 Nm** !

You can also set-up the angle position for the machine side by using the gripper keyway. Simply loosen the 6 thread pins.

Then adjust to the desired location.

CAUTION

After the desired angle has been set-up and before the use of the angle head, make sure the 6 thread pins have been fully tightened ! **Tightening torque 3 Nm**

5 Coolant Supply

- **For external coolant:**

Open the fish eye or remove the screw plug and install the appropiate screw joint along with the coolant pipes.

- **Für use with internal coolant:**

CAUTION

CAUTION – COOLANT CONTENTS
Missuse kann cause tool damage.
Coolant may not contain particles bigger than 15 µm.

CAUTION – COOLANT LEAKAGE
Coolant leakage can cause serious damage. Small amounts of leakage are tolerable. Leakage in large quantities (i.e. continious flow of coolant) suggests defective seals and damage will occur to the angle head.

CAUTION – COOLANT CONTAMINATION
Use of contaminated coolant can cause damage. Pay attention to all directions from your coolant supplier. Regularly clean and remove any residue. Be sure to wear protective gloves.

6 Initial Operation and Application

Check to make sure the tool has not been damaged during transport. If there is apparant damage from transportation, DO NOT operate the tool. Immediately inform your sales representative of the damage.

Important

IMPORTANT INFO:
Proof all of the provided drawings and data sheets against the following criteria:

- Proper machine adaptor
- Enough room in turret for angle head
- Enough room in tool magazine for angle head
- Angularity of the angle head
- Check the tool weight against the max. allowed weight of the tool changer

Check The Following Procedures Before Tool Operation Begins:

- **Make sure no collisions can occur in the tool magazine !**
- **Make sure no collisions occur when the tool is automaticaly switched !**
- **Make sure there is nothing blocking the path of the angle head that could cause a collision during automatic change !**
- **Make sure all adaptors are properly set-up !**
- **Make sure there are no physical defects on the angle head !**

Always keep in mind when tool is operating:

- **Gear Ratio**
- **Clamping chucks properly used**
- **Make sure clamped tools are all set-up properly to perform within tolerance**

7 Issues und Troubleshooting

HINWEIS:
Malfunctions or misuse of the angle head can cause a shorter life span and a reduction of accuracy.

If there is ever an issue that arises with you angle head, please contact your sales representative.

Issue	Test	Solution
Too high noise level.	Inspect the length of the locking devise and if necessary, the base support.	Length of the locking devise and base support should be inspected by Mimatic GmbH.
Excessive heating.	Inspect the length of the locking devise and if necessary, the base support. Inspect the angle head for leakage und loss of lubrication.	Length of the locking devise and base support should be inspected by Mimatic GmbH. Complete maintence and repair by Mimatic GmbH.
Excessive heating on angle head with internal coolant.	Inspect the pathway of the coolant bores. Is coolant being received from machine?	Flush the coolant pathways. Make sure the coolant pathways are fully open.
Dimensionel – or form defect on the work piece.	Inspect the tool for too much wear. Tool drifiting due to too much clamping force or too high of a feed rate. Are there concentricity flaws? Too great of variation between finished workpieces?	Switch out used tool. Reduce clamping force, feed rate or any other necessary application parameters. Make sure the tool is properly clamped. Measure the angularity and adjust the angle head accordingly.

8 Maintenance & Repair

Regularly clean the surfaces of the angle head with a cloth and for the hard to reach places, use a small brush. To increase the life of the angle head, we recommend that after 1 year of use, send the tool to Mimatic for a complete maintenance and service check. .

If you replace the lubrication, please observe the following:

- **Lubrication – High Performance; Manufacturer KLÜBER Isoflex NBU 15**

Mimatic recommends that you regularly oil the angle head to prevent corrosion.

NOTE:
Disassembling the angle head – without the approval of Mimatic can result in a forfeiture of the warranty!!

SERVICE:
If requested, Mimatic can perform a service test on your angle head. We will disassemble the angle head, inspect, perform maintenance and inform you if any replacement parts are needed.

8.1 Maintenance

Recommendation – INCREASING THE LIFE OF THE TOOL
During the use of the tool it is recommended every 2 weeks to inspect all moving parts and make sure the tool is running smoothly. Remove all chips, coolant and dirt, to ensure that all parts of the head are running without obstruction.
Remove any cleaning materials with pressurised air. This insures that no particles will be caught in the tool and damage to the seals will be avoided.

8.2 Repair

The bearings, gears and sealing elements naturally endure wear and tear. This wear is dependent on:

- How long and often the head is run.
- How fast the tool is being run.
- What type of application the tool is being used for.

Monitor the tool with the above criteria, so that any damaged part can be detected early, and no permanent damage is caused to the head.

CAUTION

CAUTION

Repairs may only be performed by qualified personel. If you decide to try and do a repair yourself, please contact Mimatic for the recommended replacement parts.

CAUTION - COLLISION

After a repair has been made, make sure to perform a collision test with a clamped cutting tool in the machine, to avoid any crashes.

CAUTION – LUBRICANT AND HYDRAULIC FLUIDS

Always wear protective gloves when dealing with either of the above mentioned.
Skin contact: wash with soap and rinse thoroughly with water.
Eye contact: Flush eyes thoroughly with water and contact your doctor.
When swallowed: contact your doctor immediatly.